



Georgia Basin-Puget Sound Ecosystem Indicators Report

Technical Backgrounders

Terrestrial Protected Areas

Spring 2002

**Transboundary Georgia Basin-Puget Sound
Working Group on Environmental Indicators**

Georgia Basin Ecosystem Initiative, Environment Canada
BC Ministry of Water, Land and Air Protection
Puget Sound Water Quality Action Team
Washington State Department of Ecology
US Environmental Protection Agency

Protected Areas in the Georgia Basin

Indicator: *The percent of the Georgia Basin area that is in protected area status.*

Selection of Indicator

The percent of the Georgia Basin area that is dedicated to protected area status is a *response* indicator. This indicator measures progress on the achievement of two of the BC Ministry of Environment, Lands and Parks' strategic goals: (1) natural diversity, and (2) sustainable social, economic and recreational benefits. In 1993, the Province of British Columbia implemented a Protected Areas Strategy to develop and expand the protected areas system to 12% of the provincial land base by the year 2000. Progress for the Georgia Basin region is measured against the achievement of the 12% provincial goal.

Data and Sources:

Table 1. Protected areas in the Georgia Basin summarized by watershed group.
A complete listing of protected areas in the Georgia Basin is provided in Appendix A.

WATERSHED GROUP	TOTAL AREA (ha)	AREA IN PROTECTED AREA STATUS (ha)	% IN PROTECTED AREA STATUS
CAMPBELL RIVER	175443	96328	54.9
CHILLIWACK RIVER	120748	14078	11.7
COMOX	236817	13658	5.8
COWICHAN	281125	1826	0.6
*FRASER CANYON	463821	32084	6.9
HARRISON RIVER	305455	3327	1.1
JERVIS INLET	482775	15631	3.2
LILLOOET	602453	127711	21.2
LOWER FRASER	469961	146422	31.1
PARKSVILLE	166955	5839	3.5
*SAN JUAN RIVER	296419	28724	9.7
SKAGIT RIVER	105466	67533	64.0
SQUAMISH	533760	116101	21.7
*TOBA INLET	416626	11524	2.7
VICTORIA	97847	14232	14.4
TOTAL Georgia basin land area (sum of watershed group area in GB	4755671	694434 ¹	14.6
Total land and marine waters area in the Georgia Basin (summed from GIS, includes marine area)	5620542	694434	12.4
GIS TOTAL for GB and including 4,082 ha of protected area in edge watershed groups eliminated from analysis **	5620542	694434	12.4

Sources: Land Use Coordination Office (LUCO) 2001; BC Ministry of Environment, Lands and Parks 2001. Notes: LUCO data is as of Aug. 2000. Watershed groups are from Watersheds BC (Geographic Data BC 1999).

* Watershed group overlaps the Georgia Basin boundary and the total area (ha) given is for only the portion of the watershed group within the Georgia Basin. ** Protected areas in watershed groups where

the majority of the area lies outside the Georgia Basin boundary have been omitted from the analysis.¹ Includes a small amount of marine area. About 8500 hectares of marine habitat is in the protected areas included in this analysis. It was not possible to disaggregate the total marine area by watershed group.

Methodology and Reliability

Definition of protected area: Protected areas in the Georgia Basin are defined as areas that meet the criterion for Categories I - III of the World Commission on Protected Areas, one of six commissions of the World Conservation Union (IUCN 1998; see Table 2). These categories represent protected areas managed for conservation of natural diversity and ecosystem integrity. These areas are managed mainly for protection of ecosystems or specific natural features. Included in the Georgia Basin protected area summary are national parks, ecological reserves, Class A and C parks, recreation areas, protected areas that fall under the *Environment and Land Use Act*, Regional Parks, National Wildlife Areas, and lands owned by The Land Conservancy of British Columbia and the Nature Conservancy of Canada. Included are protected areas that have been announced but are not yet legally designated by or under the *Protected Areas of British Columbia Act*, *Park Act*, *Ecological Reserve Act* or other protected areas legislation. Not included in the analysis are areas such as federal Migratory Bird Sanctuaries, provincial Wildlife Management Areas and urban parks as these do not fall within the IUCN categories I, II or III.

Table 2. IUCN Protected Area Management Categories.

Category Designation	Description
Ia	Strict Nature Preserve: protected area managed for science
Ib	Wilderness Area: protected area managed mainly for wilderness protection
II	National Park: protected area managed mainly for ecosystem protection and recreation
III	Natural Monument: protected area managed mainly for conservation of specific natural features
IV	Habitat/Species management Area: protected area managed mainly for conservation through management intervention
V	Protected Landscape/Seascape: protected areas managed mainly for landscape/seascape conservation and recreation
VI	Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems

Note: only Categories I - III were considered in this analysis.

Determination of protected areas in the Georgia Basin.

The Provincial Ministry of Sustainable Resource Management (SRM) provided a digital map of all protected included in the Protected Areas Strategy for British Columbia. The list of protected areas in the Georgia Basin is current as of August 2001. A digital map of the Georgia Basin boundary and a digital map of provincial watershed groups (both provided by Geographic Data BC 1999) were superimposed over the SRM map to produce a database file summarizing all protected areas in the Georgia Basin by watershed group (work performed by Clover Point Cartographics). Any overlapping protected areas were cut to the Georgia Basin boundary and only the area (ha) within the Georgia Basin is reported.

Regional parks, National Wildlife Areas, and protected areas owned by the Nature Conservancy of Canada and The Land Conservancy of BC were added to the database and categorized by watershed group by manually locating them on a map. Municipal parks were not included in this analysis.

All agencies were contacted by phone and asked to provide a listing of areas under their jurisdiction that were completely protected and had a biodiversity or conservation component in the management plan. A copy of the IUCN categories was provided as a guideline. Only 4 of the 9 regional districts occurring in the Georgia Basin had protected areas that fit the criteria.

Regional District	IUCN I-III protected areas
Greater Vancouver Regional District (GVRD)	yes
Capitol Regional District (CRD)	yes
Comox Strathcona Regional District	yes
Fraser Valley Regional District	yes
Cowichan District	no
Sunshine Coast Regional District	no
Nanaimo Regional District	no
Powell River Regional District	no
Squamish-Lillooet Regional District	no

Size of Protected Areas

There are slight differences between the Land Use Coordination Office and BC Parks estimates of protected area sizes because of differences in methodology. The result is some discrepancies in protected area sizes between the two sources. The park names and sizes listed in Appendix A are largely from LUCO but were reviewed by Ken Morrison (BC Parks) and Kathleen Moore (CWS), and corrections were made accordingly. Appendix A gives the complete list of protected areas in the Georgia Basin.

Calculation of % dedicated to Protected Area status

The percent dedicated to protected area status is presented in two ways; by watershed group and by total Georgia Basin area.

Percent of Protected Area by Watershed Group

The percent for each watershed group dedicated to protected area status was derived by dividing the total number of hectares with protected area status in a watershed group by the total number of hectares for the watershed group. Watershed groups are from The Watershed Atlas (BC Ministry of Fisheries 1998) and include only terrestrial area (i.e. do not include marine areas of Georgia Basin).

The size in hectares for each watershed group was determined using Watersheds BC amalgamation software (Geographic Data BC 1999). Three watershed groups (Toba Inlet, San Juan River and Fraser Canyon) overlapped outside of the Georgia Basin boundary by less than 30%. Watersheds within these watershed groups that fell completely outside the boundary or overlapped outside of it by more than 50% were removed from the analysis. Consequently, the total area for these three watershed groups includes only the portion that lies within the Georgia Basin. Some protected areas occurred in watershed groups that overlapped outside of the Georgia Basin

boundary by more than 70%. These 'edge' watershed groups and the protected areas within them were excluded from reporting in Table 1. A listing of these watershed groups can be found in Appendix B.

Total Percent Protected in Georgia Basin

The total percent of protected area in the Georgia Basin is derived by dividing the number of hectares with protected area status by the total area in hectares of the Georgia Basin. The numerator, the total hectares protected, is calculated by summing the number of hectares protected in each watershed group, as described above. The denominator, the total area of the Georgia Basin, was calculated in two ways; one using the total area of the watershed groups, the other using the GIS total area calculation. The total area of the Georgia Basin calculated from the watershed groups is smaller because it does not include marine waters. The GIS total area includes the marine water area of the Strait of Georgia, the Strait of Juan de Fuca, and the area off the west coast of Vancouver Island. Using the watershed groups total as the denominator results in an estimated 14.6% of the Georgia Basin being dedicated to protected area status protected area, whereas using the GIS total area as the denominator reduces the percentage to 12.4%.

When all protected areas within the Georgia Basin boundary are included, including those in 'edge' watershed groups (see Appendix B), the percentage of the Georgia Basin dedicated to protected area status remains at 12.4%. The total area of protected land in the 'edge' watershed groups is 4,083 ha.

References:

Canadian Wildlife Service. 1994. National wildlife areas and migratory bird sanctuaries. Environment Canada, pamphlet.

Fisheries BC. The watershed atlas. Available from the Ministry of Environment, Lands and Parks ftp site (<ftp.env.gov.bc.ca>).

Geographic Data BC. 1999. Watersheds BC: watershed ranking and assessment product . BC Ministry of Environment, Lands and Parks.

IUCN 1998. 1997 United Nations list of protected areas. Prepared by WCMC and WCPS. IUCN, Gland, Switzerland and Cambridge, UK. 412 pp.

Jamieson G. S. and J. Lessard. 2000. Marine Protected Areas and Fishery Closures in British Columbia. NRC Research Press, Ottawa.

Land Use Coordination Office. 1999 protected area data. BC Ministry of Environment, Lands and Parks. Available on the Internet at: http://ftp.gis.luco.gov.bc.ca/pub/outgoing/to_atlas (files: pa5aug00.eoo and pa5aug99.meta)

Lewis, K. and S. Westmacott, 1996. *A protected areas strategy for British Columbia: provincial overview and status report*. Victoria B.C., BC Ministry of Environment, Lands

and Parks, Land Use Coordination Office, 1996. Available on the Internet from <http://www.luco.gov.bc.ca/pas/pasdocs.htm>

Contacts:

- SRM data: Susan Westmacott, Ministry of Sustainable Resource Management: ph: 250-356-5450; email: swestmac@gis.luco.gov.bc.ca
- Data review: Ken Morrison, Senior Park/Ecological Reserve Planner, BC Parks: ph: 250-356-0536; email: Ken.Morrison@gems4.gov.bc.ca
- Data review: Kathleen Moore Environment Canada, Canadian Wildlife Service: ph:604-940-4660, email: Kathleen.moore@ec.gc.ca
- GIS Data summary: Nancy Liesch, Clover Point Cartographics Ltd.: ph: 250-; 384-3537; email: cloverpoint@pinc.com
- Files for Georgia Basin GIS boundary and watershed group GIS boundaries: Malcolm Gray, Geographic Data BC.: Ph.: 250-387-9365. Email: Malcolm.Gray@gems3.gov.bc.ca
- List of provincial protected areas adjacent to or including marine areas: Doug Biffard, BC Parks, email: Doug.Biffard@gems2.gov.bc.ca

Contacts in Regional Districts with IUCN class I to III protected areas

- Tracey Fleming, CRD Vegetation Ecologist, Capital Regional District, ph: 250-478-3344; email: tfleming@crd.bc.ca.
- Paul Skydt, Vancouver Regional District: ph: 604-432-6200; email: paul.skydt@GVRD.bc.ca
- Hugh Sloan, Fraser Valley Regional District: ph: 1-604-702-5005; email: hsloan@fvr.bc.ca
- Alison Mewett, Comox-Strathcona Regional District: ph: 250-334-6000; email: amewett@rdcs.bc.ca
- Kathleen Moore, Environment Canada, Canadian Wildlife Service: ph: 604-940-4660; email: Kathleen.moore@ec.gc.ca
- Karen Wipond, Wildlife Branch, BC Ministry of Environment, Lands and Parks: ph: 250-387-9742; email: Karen.Wipond@gems8.gov.bc.ca
- Eileen Palmer, The Land Conservancy of BC: ph: 250-361-7693; email: admin@conservancy.bc.ca
- Andrew MacDonald (Conservation Coordinator), Nature Conservancy of Canada: ph: 250-479-3191
- Jim Marsh, Parks Planning Coordinator, Development Services Department, Cowichan Valley Regional District: ph (250-746-2620)

Contacts in Regional Districts without IUCN class I to III protected areas.

- Jim Marsh, Parks Planning Coordinator, Cowichan District. Ph: 250-746-2500; Email: cvrdds@island.net
- Randy Udall, Sunshine Coast Regional District: ph: 250-885-2261
- David Speed, Nanaimo Regional District: ph: 1-888-828-2069; email: dlspeed@island.net
- Don Turner, Powell River Regional District: ph: 250-483-3231; email: regdist@prcn.org
- Squamish-Lilloet Regional District, District office: ph: 250-894-6371

- Robyn Addison, Islands Trust: ph: 250-405-5162.

Supplementary information

Size of Protected Areas in the Georgia Basin

A debate exists as to the relative value of large versus small protected areas. This table presents the size composition of the protected areas listed in Appendix A. 86% of the protected areas in the basin are 1000 hectares or smaller in size, but these account for only 0.6% of the protected area in the basin. Most of the protected area is in a relatively small number of large protected areas.

Data and Source:

Table 3. Size of Protected Areas in the Georgia Basin.

Size of Protected Area in hectares	Total
<10	34
10-100	91
100-1,000	86
1,000-10,000	24
10,000-100,000	7
100,000-1,000,000	1
1,000,000+	0
Total	243*

Sources: LUCO and BC Ministry of Environment, Lands and Parks 2000

*Although 254 protected areas were identified for the primary indicator, this analysis includes only those protected areas whose boundaries are entirely within the Georgia Basin. Based on this criterion, 11 protected areas were excluded from the size frequency analysis because they overlapped the basin boundary. The table below lists these protected areas and the area of each that is inside the Georgia Basin boundary.

Protected Areas excluded from size analysis.

Protected Area Name	Hectares in the Georgia Basin
Strathcona	110,714
Cascade	11,373
Pacific Rim West Coast Trail	10,099
Desolation Sound Marine	7,905
EC Manning	28,747
Coquihalla Summit	5,706
Joffre Lakes	1,473
Elk Falls	967
Stein Valley	288
Nitinat River	79
Bishop River	14

Supplementary Information

Coastal areas protected. The Georgia Basin is a coastal region. The following analysis presents the number and percentage of the 254 Protected Areas in the Georgia Basin

that are adjacent to marine areas or include marine areas in their boundaries. Appendix C and D lists these protected areas.

Description	Number of PAs	Percent of total ¹
Number that are adjacent to or include marine habitat	108	42%
Number that are adjacent to marine waters	68	27%
Number that include marine habitats	40	16%

¹ Total refers to total number of Protected Areas in the Georgia Basin analysis, which equals 254.

Source: BC Parks 2001, Analysis State of Environment Reporting, Ministry of Environment, Lands and Parks 2001.

The following analysis presents the total hectares of marine foreshore protected in the 37 provincial protected areas listed in Appendix D.

Watershed Group Name	Hectares of protected marine habitat
Comox	147
Cowichan	62.3
Jervis Inlet	146.5
Lower Fraser	0
Parksville	3147
San Juan River	200
Squamish	45.5
Toba Inlet	3015
Victoria	1771.22
TOTAL	8534.52

Source: BC Parks 2001

Supplementary information

Areas with important wildlife value that cannot be categorized as IUCN I, II or III because of different objectives.

Data and Source:

Table 4. Summary of wildlife areas excluded from Georgia Basin analysis.

Name	Area (Ha)	Type	Agency
Victoria Harbour	1700	MBS	Canadian Wildlife Service
Esquimalt Lagoon	130	MBS	Canadian Wildlife Service
Shoal Harbour	150	MBS	Canadian Wildlife Service
Christie Islet	0.8	MBS	Canadian Wildlife Service
George C. Reifel	648	MBS	Canadian Wildlife Service
Pitt-Addington	2882	WMA	BC Ministry of Water, Land and Air Protection
Green Mountain	300	WMA	BC Ministry of Water, Land and Air Protection
South Arm Marshes	850	WMA	BC Ministry of Water, Land and Air Protection
Parksville-Qualicum	873	WMA	BC Ministry of Water, Land and Air Protection
Coquitlam River	17	WMA	BC Ministry of Water, Land and Air Protection
Boundary Bay	11,470	WMA	BC Ministry of Water, Land and Air Protection
Sturgeon Bank	5152	WMA	BC Ministry of Water, Land and Air Protection

Sources: Canadian Wildlife Service 2000; BC Ministry of Environment, Lands and Parks, Wildlife Branch 2000.

MBS- Migratory Bird Sanctuary. Regulations prohibit all disturbance, hunting, and collection of migratory birds and their eggs within a MBS. No firearms are allowed. Regulations only control activities within sanctuary boundaries when migratory birds are actually present and do not provide protection of habitat.

WMA - Wildlife Management Area. WMA's are not included as they are in category IV. While fish/wildlife/habitat is the priority, other uses (agriculture, grazing, logging etc.) may be accommodated depending on the objectives established for that particular site. The WMA designation also does not affect any rights granted before the designation (Wildlife Act, Section 4 (3)).

Supplementary information

Comparison with other jurisdictions

With 14.6% of the land base dedicated to protected area status, the Georgia Basin exceeds the broad provincial goal of 12%. As of December 2000, British Columbia had just over 12% of its land base protected. This is the highest percentage of land protection in Canada and is higher than the US and Sweden, but not higher than New Zealand which has approximately 18% of its land base protected (World Conservation Union (IUCN), 1998, *1997 United Nations List of Protected Areas*).

Among the three countries being compared to BC (Sweden, US, and New Zealand) the definition of a protected areas is those areas that meet the World Conservation Union (IUCN) categories I to III and are greater than 1000 hectares in size. The BC and Georgia Basin analysis, however, includes all protected areas regardless of size that meet the definitions in Criteria I to III. The comparison is still valid, however, because the percentage of protected land contributed by areas <1000 hectares is small and is unlikely to change the rank order of the countries. For example, in the Georgia Basin the percentage of the total land area that is protected by small areas less than 1000 hectares is only .6% of the basin land areas. Whereas the percentage of the land area protected in areas >1000 is 14% of the land area.

Data and Sources:

Jurisdiction	Total Area (km ²)	Protected Area (km ²)	Percent Protected
New Zealand ¹	268,676	47,367	17.6
British Columbia ²	947,580	117,170	12.4
U.S. ¹	9,372,614	702,976	7.5
Canada ³	9,944,000	636,442	6.4
Sweden ¹	440,940	20,448	4.6

Sources: ¹ New Zealand, U.S. and Sweden protected areas from *1997 United Nations List of Protected Areas*, accurate to the end of 1996. Total area of jurisdictions from The Concise Columbia Electronic Encyclopedia. ² British Columbia protected areas from British Columbia Land Use Coordination Office and is accurate to the end of 2000.

³ Canadian protected areas from World Wildlife Fund 1999. *Endangered Spaces, Progress Report on Protecting Canada's Wild Lands*, accurate to the end of March 1999.

References:

World Wildlife Fund 1999. *Endangered Spaces, Progress Report on Protecting Canada's Wild Lands*. Toronto, Ontario.

International Union for the Conservation of Nature. 1998. *1997 United Nations List of Protected Areas*. Prepared by WCMC and WCPA. IUCN, Gland, Switzerland and Cambridge, UK. 412pp.

Appendices

Appendix A: Summary of protected areas in the Georgia Basin.

Notes: all areas (ha) are approximate and should not be used for purposes where exact areas are required. Areas marked with an * overlap the Georgia Basin boundary and the area in hectares listed is only the portion within the Georgia Basin. All protected areas listed are owned by the province of BC, except where indicated under AGENCY. GVRD=Greater Vancouver Regional District; CRD=Capital Regional District; FVRD=Fraser Valley Regional District; RDCS=Regional District of Comox-Strathcona; TLC=The Land Conservancy of B.C.; NC=The Nature Conservancy of Canada; CWS=Canadian Wildlife Service.

Watershed Group Name ¹	Protected Area Name	Area (ha)	Agency
Lower Fraser	Alaksen	300	CWS
Lower Fraser	Aldergrove Lake	280	GVRD
Fraser Canyon	Alexandra Bridge Park	50	
Squamish	Alice Lake Park	378	
Jervis Inlet	Ambrose Lake Ecological Reserve	255	
Jervis Inlet	Apodaca Park	10	
Jervis Inlet	Anderson Bay Park	35	
Parksville	Arbutus Grove Park	25	
Victoria	Ayum Creek	0	TLC
Victoria	Ballingall Islets Ecological Reserve	0	
Victoria	Bamberton Park	31	
Squamish	Baynes Island Ecological Reserve	71	
Victoria	Beaumont Marine Park	60	
Victoria	Beaver Point Park (Class C)	17	
Lower Fraser	Belcarra	1116	GVRD
Victoria	Bellhouse Park	3	
Lillooet	Birkenhead Lake Park	9777	
Toba Inlet	Bishop River Park	19947	
Lillooet	Blackcomb Glacier Park	227	
Victoria	Bodega Ridge Park	149	
Lower Fraser	Boundary Bay	182	GVRD
Jervis Inlet	Bowen Island Ecological Reserve	395	
Parksville	Bowser Ecological Reserve	114	
Parksville	Boyle Point Park	130	
Squamish	Brackendale Eagle Park	715	
Victoria	Brackman Island Ecological Reserve	32	
Squamish	Brandywine Falls Park	141	
Harrison River	Bridal Veil Falls Park	33	
Cowichan	Bright Angel Park Class C	12	
Jervis Inlet	Buccaneer Bay Park	1	
Lower Fraser	Burnaby Lake	311	GVRD
Victoria	Cabbage Island Marine Park	4	
Lillooet	Callaghan Lake Park	2667	
Victoria	Bennett Bay Protected Area	11	
Lower Fraser	Campbell Valley	549	GVRD

Victoria	Canoe Islets Ecological Reserve	1	
Lower Fraser	Capilano River	143	GVRD
San Juan River	Carmanah Walbran Park	16491	
Skagit River	Cascade Recreation Area	11373	
Lower Fraser	Cascade Falls Regional Park	43	FVRD
Harrison River	Cheam Lake Wetlands Regional Park	93	FVRD
Cowichan	Chemainus River Park	108	
Chilliwack River	Chilliwack Lake Park	9258	
Chilliwack River	Chilliwack River Park	23	
Chilliwack River	Chilliwack River Ecological Reserve	86	
Toba Inlet	Clendinning Park	30330	
Lower Fraser	Colony Farm	262	GVRD
Comox	Comox Lake Bluffs Ecological Reserve	44	
Toba Inlet	Inland Lake Park	2763	
Toba Inlet	Copeland Islands Marine Park	406	
Fraser Canyon	Coquihalla Canyon Park	116	
Fraser Canyon	Coquihalla River Park	124	
Lower Nicola River	Coquihalla Summit Recreation Area	5706	
Cowichan	Cowichan Garry Oak	13	NC
Cowichan	Cowichan River Park	752	
Lower Fraser	Crippen	242	GVRD
Chilliwack River	Cultus Lake Park	2512	
Squamish	Cypress Park	2862	
Victoria	D'Arcy Island Marine Park	86	
Lower Fraser	Davis Lake Park	222	
Lower Fraser	Deas Island	72	GVRD
Lower Fraser	Derby Reach	297	GVRD
Toba Inlet	Desolation Sound Marine Park	7905	
Victoria	Dionisio Point Park	171	
Victoria	Discovery Island Marine Park	68	
Cowichan	Drumbeg Park	16	
Jervis Inlet	Duck Lake Protected Area	747	
Victoria	East Sooke	1400	CRD
Similkameen River, Skagit River	EC Manning Park	28747	
Campbell River	Elk Falls Park	967	
Fraser Canyon	Emory Creek Park	15	
Parksville	Englishman River Falls Park	97	
Cowichan	Eves Park Class C	19	
Harrison River	Ferry Island Park Class C	24	
Harrison River	F.H. Barber Park	25	
Parksville	Fillongley Park	24	
Comox	Foden Park	8	RDCS
Harrison River	Fraser River Ecological Reserve	177	
Lower Fraser	Fraser River Estuary; borders Reifel MBS	300	CWS
Lower Fraser	Fraser River Islands Reserve	209	GVRD
San Juan River	French Beach Park	55	
Cowichan	Gabriola Sands Park	7	
Victoria	Galiano Island Ecological Reserve	30	

Jervis Inlet	Garden Bay Marine Park	165	
Lillooet, Lower Fraser, Squamish	Garibaldi Park	188872	
Victoria	Georgeson Island	7	
Lower Fraser	Glen Valley	112	GVRD
Lillooet, Lower Fraser	Golden Ears Park	60980	
Victoria	Goldstream Park	315	
Cowichan	Gordon Bay Park	52	
Victoria	Gowlland Tod Park	1271	
Cowichan	Haley Lake Ecological Reserve	113	
Jervis Inlet	Halkett Bay Park	318	
Jervis Inlet	Harmony Islands Marine Park	32	
Parksville	Helliwell Park	2815	
Cowichan	Hemer Park	88	
Cowichan	Honeymoon Bay Ecological Reserve	6	
Parksville	Horne Lake Caves Park	127	
Parksville	Hudson Rocks Ecological Reserve	50	
Squamish, Lower Fraser	Indian Arm Park	6927	
Lower Fraser	Iona Beach	114	GVRD
Victoria	Island View Beach	40	CRD
Victoria	Isle-De-Lis Marine Park	5	
Parksville	Jedediah Island Park	253	
Parksville	Sabine Channel Marine Park	95	
Lillooet, Seton Lake	Joffre Lakes Park	1474	
Victoria	John Dean Park	173	
San Juan River	Juan De Fuca Park	1277	
Lower Fraser	Kanaka Creek	413	GVRD
Chilliwack River	Katherine Tye Ecological Reserve	7	
Harrison River	Kilby Park	2	
Comox	Kin Beach Park Class C	4	
Comox	Kitty Coleman Beach Park Class C	9	
Cowichan	Koksilah River Park	209	
Cowichan	Ladysmith Bog Ecological Reserve	138	
Parksville	Lasqueti Island Ecological Reserve	211	
Parksville	Little Qualicum Falls Park	452	
Chilliwack River	Liumchen Park	2141	
Victoria	Lone Tree Hill	30	CRD
Campbell River	Loveland Bay Park	27	
Lower Fraser	Lynn Headwaters	4685	GVRD
Parksville	MacMillan Park	145	
Toba Inlet	Malaspina Park	572	
Victoria	Matheson Lake and Roche Cove	200	CRD
Lower Fraser	Matsqui Trail	117	GVRD
Victoria	McDonald Park	13	
Fraser Canyon, Lillooet, Seton Lake	Mehatl Creek Park	23806	
Victoria	Memory Island Park	1	
Victoria	Mill Farm, Salt Spring Island	65	CRD
Lower Fraser	Minnekhada	211	GVRD

Comox	Miracle Beach Park	132	
Lower Fraser	Mission Foreshore Heritage Park	8	FVRD
Comox	Mitlenatch Island Nature Park	162	
Victoria	Montague Harbor Marine Park	103	
Cowichan	Morden Colliery Historical Park	7	
Victoria	Mount Maxwell Park	199	
Victoria	Mount Maxwell Ecological Reserve	65	
Squamish	Mount Seymour Park	3460	
Victoria	Mount Tuam Ecological Reserve	200	
Cowichan	Mount Tzuhalem Ecological Reserve	11	
Victoria	Mount Work	500	CRD
Jervis Inlet	Mount Elphinstone Park	141	
Parksville	Mount Geoffrey Nature Park	303	RDCS
Jervis Inlet	Mount Richardson Park	1001	
Squamish	Murrin Park	28	
Jervis Inlet	Musket Island Marine Park	17	
Fraser Canyon	Nahatlach Park	2057	
Lillooet	Nairn Falls Park	180	
Cowichan	Nanaimo River	57	TLC
Victoria	Narvaez Bay, Saturna Island	645	
Lower Fraser	Neilson Regional Park	10	FVRD
Parksville	Newcastle Island Marine Park	308	
Fraser Canyon	Nicolium River Park	24	
San Juan River	Nitinat Lake Ecological Reserve	70	
San Juan River	Nitinat River Park	79	
Comox	Nymph Falls Nature Park	56	RDCS
Victoria	Oak Bay Islands Ecological Reserve	211	
Toba Inlet	Okeover Arm Park	4	
Comox	Oyster Bay Shoreline Protection Park	2	RDCS
Comox	Oyster River Nature Park	5	RDCS
Alberni Inlet, San Juan River	Pacific Rim - West Coast Trail	10100	Parks Canada
Lower Fraser	Pacific Spirit	809	GVRD
Lower Fraser	Peace Arch Park	8	
Parksville	Petroglyph Park	1	
Lower Fraser, Squamish	Pinecone Burke Park	36956	
Cowichan	Pirates Cove Marine Park	18	
Lower Fraser	Pitt Polder Ecological Reserve	100	
Jervis Inlet	Plumper Cove Marine Park	57	
Jervis Inlet	Porpoise Bay Park	54	
Squamish	Porteau Cove Park	43	
Victoria	Prevost Island Protected Area	99	
Jervis Inlet	Princess Louisa Marine Park	58	
Victoria	Princess Margaret Marine park	575	
Victoria	Prior Centennial Park	16	
Parksville	Qualicum - Rosewall Creek Unit	19	CWS
Parksville	Qualicum Bat House	1	TLC
Parksville	Qualicum-Marshall-Stevenson Unit	30	CWS
Parksville	Qualicum-Nanoose Bay Unit	34	CWS

Victoria	Race Rocks Ecological Reserve	227	
Parksville	Rath Trevor Beach Park	349	
Jervis Inlet	Roberts Creek Park	47	
Cowichan	Roberts Memorial Park	12	
Lower Fraser	Rolley Lake Park	99	
Victoria	Rose Islets Ecological Reserve	1	
Parksville	Rosewall Creek Park	66	
Skagit River	Ross Lake Ecological Reserve	62	
Victoria	Ruckle Park	486	
Victoria	Russel Island Protected Area	16	
Jervis Inlet	Saltery Bay Park	59	
San Juan River	San Juan Ridge Ecological Reserve	90	
San Juan River	San Juan River Estuary Ecological Reserve	56	
Cowichan	Sandwell Park	14	
Parksville	Sandy Island Marine Park	28	
Jervis Inlet	Sargeant Bay Park	65	
Harrison River	Sasquatch Park	1339	
Victoria	Satellite Channel Ecological Reserve	340	
Victoria	Saturna Island Ecological Reserve	121	
Comox	Seal Bay Forest	563	RDCS
Comox	Seal Bay Nature Park	152	RDCS
Jervis Inlet	Sechelt Inlets Marine Park - Halfway Beach site	4	
Jervis Inlet	Sechelt Inlets Marine Park - Kunechin Point site	44	
Jervis Inlet	Sechelt Inlets Marine Park - Piper Point site	6	
Jervis Inlet	Sechelt Inlets Marine Park - Skaiaikos Point site	1	
Jervis Inlet	Sechelt Inlets Marine Park - Thornhill	4	
Jervis Inlet	Sechelt Inlets Marine Park - Tzoonie Narrows site	82	
Squamish	Shannon Falls Park	86	
Victoria	Sidney Spit Marine Park	394	
Fraser Canyon	Silver Lake Park	110	
Jervis Inlet	Simson Park	486	
Skagit River	Skagit River Cottonwoods Ecological Reserve	91	
Skagit River	Skagit River Forest Ecological Reserve	76	
Skagit River	Skagit River Rhododendrons Ecological Reserve	65	
Skagit River	Skagit Valley Park	27961	
Jervis Inlet	Skookumchuck Narrows Park	153	
Jervis Inlet	Smuggler Cove Marine Park	181	
Victoria	Sooke Hills Wilderness and Mount Wells	4000	CRD
San Juan River	Sooke Potholes Park	2	
Victoria	South Otter Bay Protected Area	219	
Jervis Inlet	South Texada Island Park	1035	
Cowichan	South Winchelsea Island	10	TLC
Victoria	Spectacle Lake Park	65	

Parksville	Spider Lake Park	58	
Jervis Inlet	Spiipiyus Park	2979	
Parksville	Squitty Bay Park	12	
Squamish	Stawamus Chief Park	506	
Fraser Canyon, Lillooet, Seton Lake	Stein Valley Nlaka pamux Hertigae Park	288	
Fraser Canyon	Stoyoma Creek Ecological Reserve	74	
Alberni Inlet, Campbell River, Clayoquot, Comox, Gold River, Salmon River	Strathcona Park	110714	
Chilliwack River, Harrison River	Sumas Mountain Park	183	
Harrison River	Sumas Mountain Regional Park	1497	FVRD
Lower Fraser	Surrey Bend/Robert Point	362	GVRD
Lower Fraser	Swishwash Island	29	NC
Jervis Inlet, Squamish	Tantalus Park	11352	
Victoria	Taylor Point, Saturna Island	51	
Victoria	Ten Mile Point Ecological Reserve	12	
Jervis Inlet	Tetrahedron Park	6164	
Harrison River	Thacker Mountain Regional Park	9	FVRD
Victoria	Thetis Lake, Mill Hill and Francis King	1000	CRD
Victoria	Trial Islands Ecological Reserve	20	
Jervis Inlet	Triangle Lake Park	80	
Parksville	Tribune Bay Park	95	
Victoria	Tumbo Island Protected Area	121	
Lower Fraser	Tynehead	261	GVRD
Lillooet	Upper Lillooet Park	19996	
Victoria	Wallace Island Marine Park	83	
Victoria	West Shawnigan Lake Park	9	
Cowichan	Whaleboat Island Marine Park	6	
Lower Fraser	Widgeon Marsh Reserve	559	GVRD
Lower Fraser	Widgeon Valley	125	CWS
Victoria	Winter Cove Park	95	
Victoria	Witty's Lagoon	56	CRD
Comox	Wood Mountain Ski Park Class C	102	
Cowichan	Woodley Range Ecological Reserve	159	
Fraser Canyon	Yale Garry Oak Ecological Reserve	12	
		698464	

Appendix B. Protected areas in 'edge' watershed groups

The following list summarizes the protected area totals for the watershed groups that were not included in Table 1 because they fall largely outside of the Georgia Basin boundary.

Watershed Group	Protected Area (Ha)
Alberni Inlet	2320
Clayoquot	684
Gold River	0.5
Homathco River	11
Lower Nicola River	11
Salmon River	0.7
Seton Lake	218
Similkameen River	838
Total Omitted	4083

Appendix C: Protected Areas adjacent to marine habitat

All protected areas listed are owned by the province of BC, except where indicated under AGENCY. GVRD=Greater Vancouver Regional District; CRD=Capital Regional District; FVRD=Fraser Valley Regional District; RDCS=Regional District of Comox-Strathcona; TLC=The Land Conservancy of B.C.; NC=The Nature Conservancy of Canada; CWS=Canadian Wildlife Service; PMHL=Pacific Marine Heritage Legacy.

Protected Areas in the Georgia Basin adjacent to marine areas

Watershed Group Name	Protected Area Name	Location	Agency
Parksville	Boyle Point	SE Denman Island	
Parksville	Fillongley	Denman Island	
Parksville	Jedediah Island Marine	N end of Sabine Channel	
Parksville	Sandy Island Marine	off north end of Denman Island	
Parksville	Squitty Bay	east side of Lasqueti Island	
Comox	Kin Beach	Comox	
Comox	Kitty Coleman Beach	Merville near Courtenay	
Parksville	Lasqueti Island	Lasqueti Is., off Georgia	
Victoria	Ballingall Islets Nature	off W Coast Galiano Island	
Victoria	Bamberton	5km S of Mill Bay	
Victoria	Beaumont Marine	Bedwell Harbour, S Pender Is	
Victoria	Bellhouse	Galiano Island	
Victoria	Cabbage Island Marine	island E of Saturna Island	
Victoria	D'Arcy Island Marine	Haro Strait, S. of Sidney Is	
Victoria	Dionisio Point	Coon Bay, NW Galiano Island	
Victoria	Discovery Island Marine	island 2km E of Victoria	
San Juan River	French Beach	5km E of Jordan River, Sooke	
Victoria	Isle-De-Lis Marine	off Sidney	
Victoria	Mount Maxwell	Saltspring Island	

Watershed Group Name	Protected Area Name	Location	Agency
Cowichan	Roberts Memorial	19km SE of Nanaimo	
Victoria	Ruckle	SE Salt Spring Island	
Victoria	Beaver Point	Salt Spring Island	
Victoria	Brackman Island	N side of Shute Passage	
Victoria	Canoe Islets	NW entr. to Porlier Pass	
Victoria	Mount Maxwell Ecological Reserve	facing Sansum Narrows	
Victoria	Rose Islets	off N tip of Reid Island	
Victoria	Trial Islands	1 km E of Victoria	
Victoria	Bennett Bay	Mayne Island	
Victoria	Prevost Island	Prevost Island	
Victoria	Russell Island	South of Saltspring Island	
Victoria	South Otter Bay	North Pender Island	
Victoria	Tumbo Island	North of Saturna Island	
Jervis Inlet	Apodaca	on Bowen Island	
Jervis Inlet	Anderson Bay Park	Texada Island	
Toba Inlet	Malaspina Park	Malaspina Peninsula	
Squamish	Indian Arm	Indian Arm, Vancouver	
Jervis Inlet	Buccaneer Bay	N Thormanby Island	
Jervis Inlet	Musket Island Marine	Ent Jervis Inlet at Powell R.	
Toba Inlet	Okeover Arm	Malaspina Strait	
Campbell River	Elk Falls	10km NW of Campbell River	
Jervis Inlet	Porpoise Bay	5km N of Sechelt	
Jervis Inlet	Roberts Creek	10km W of Gibsons Landing	
Jervis Inlet	Simson	South Thormanby Island	
Jervis Inlet	Skookumchuck Narrows	13km N of Sechelt	
Jervis Inlet	South Texada Island	24 km N of Parksville	
Squamish	Baynes Island	in Squamish River	
Jervis Inlet	Sechelt Inlets Marine - Halfway Bay	11km N of Porpoise Bay	
Jervis Inlet	Sechelt Inlets Marine - Kunechin	Salmon Inlet	
Jervis Inlet	Sechelt Inlets Marine - Piper Point	8km N of Porpoise Bay	
Jervis Inlet	Sechelt Inlets Marine - Skaiaikos Point	10km NW of Porpoise Bay	
Jervis Inlet	Sechelt Inlets Marine - Thornhill	Salmon Inlet	
Jervis Inlet	Sechelt Inlets Marine - Tzoonie Narrows	Narrows Inlet	
Lower Fraser	Belcarra		GVRD
Victoria	East Sooke		CRD
Lower Fraser	Fraser River Estuary; borders Reifel MBS		EC
Lower Fraser	Crippen		GVRD
Lower Fraser	Pacific Spirit		GVRD
Victoria	Matheson Lake and Roche Cove		CRD
Victoria	Gerogeson Island		PMHL

Watershed Group Name	Protected Area Name	Location	Agency
Lower Fraser	Iona Beach		GVRD
Victoria	Island View Beach		CRD
Parksville	Jervis Island and Bunny Island		PMHL
Victoria	Narvaez Bay, Saturna Island		PMHL
Comox	Oyster Bay Shoreline Protection Park		SRD
Alberni Inlet, San Juan River	Pacific Rim - West Coast Trail		PARKS CANADA
Parksville	Qualicum-Marshall-Stevenson Unit		EC
Cowichan	South Winchelsea Island		TLC
Victoria	Taylor Point, Saturna Island		PMHL
Victoria	Witty's Lagoon		CRD

Source: BC Parks 2001

Appendix D: Protected Areas that include marine areas

Protected Areas in the Georgia Basin that include marine areas

Watershed Group Name	Site Name	Location	Agency
Toba Inlet	Copeland Islands Marine	19km N of Powell River	
Toba Inlet	Desolation Sound Marine	32km N of Powell River	
Cowichan	Gabriola Sands	Gabriola Island	
Cowichan	Drumbeg Park	Gabriola Island	
Jervis Inlet	Garden Bay Marine	near Pender Harbour	
Victoria	Goldstream	16km NW of Victoria	
Victoria	Gowlland Tod	Eastside of Saanich Inlet	
Victoria	Bodega Ridge Park	Galiano Island	
Jervis Inlet	Halkett Bay	Gambier Island	
Jervis Inlet	Harmony Islands Marine	38 km east of Powell River	
Parksville	Helliwell	Hornby Island	
Squamish, Lower Fraser	Indian Arm	North Vancouver	
San Juan River	Juan de Fuca	2 Km NE of Jordon River	
Comox	Miracle Beach	23km N of Courtenay	
Comox	Mitlenatch Island Nature	N off Miracle Beach, Parksville	
Victoria	Montague Harbour Marine	Galiano Island	
Parksville	Newcastle Island Marine	island by Nanaimo	
Cowichan	Pirates Cove Marine	DeCourcy Island	
Jervis Inlet	Plumper Cove Marine	Keats Island	
Squamish	Porteau Cove	Howe Sound	
Jervis Inlet	Princess Louisa Marine	Princess Louisa Inlet	
Victoria	Princess Margaret Marine	Portland Island	
Parksville	Rath Trevor Beach	3km S of Parksville	
Jervis Inlet	Saltery Bay	Saltery Bay	
Cowichan	Sandwell	north end of Gabriola Island	

Watershed Group Name	Site Name	Location	Agency
Jervis Inlet	Sargeant Bay	7 km W of Sechelt	
Victoria	Sidney Spit Marine	north end of Sidney Island	
Jervis Inlet	Smuggler Cove Marine	NW of Halfmoon Bay	
Parksville	Tribune Bay	Hornby Island	
Victoria	Wallace Island Marine	W of Galiano Island	
Cowichan	Whaleboat Island Marine	North Gulf Islands	
Victoria	Winter Cove	NW tip of Saturna Island	
Parksville	Hudson Rocks	25 km N of Newcastle Island	
Victoria	Oak Bay Islands	small island E of Oak Bay	
Victoria	Race Rocks	Strait of Juan de Fuca	
Victoria	Satellite Channel	in Central Sattelite Ch.	
Victoria	Ten Mile Point	at Cadboro Point	
Lower Fraser	Boundary Bay		GVRD
Parksville	Qualicum-Nanoose Bay Unit		EC

Source: Provincial jurisdiction , BC Parks 2001 Last 3 protected areas, GVRD 2000, Jamieson and Lessard 2000.

Protected Areas in the Puget Sound

In the Puget Sound, protected areas do not include state or federal lands actively managed to support timber or mining operations. However, a strong case could be made for including these lands if they were provided similar levels of protection through long-term management commitments, such as riparian reserves and late growth forest reserves managed by the National Forest Service under the Northwest Forest Plan Agreement.

Technical Note regarding the Protected Lands Data Set :

Compiled data set: Publicly-Protected Lands Data Sources. A digital dataset of candidate lands was produced by extracting polygons from three source datasets: “POCA”, from Washington State Dept. of Natural Resources (WDNR); “Major Public Lands” (MPL), also from WDNR; and “Land Use Allocation” (LUA), representing federal land management allocations prescribed under the Northwest Forest Plan, from the Regional Ecosystem Office in Portland, Oregon.

From POCA, polygons coded as “Natural Area Preserve” or “Natural Resource Conservation Area” were extracted to produce an interim data set. From MPL, polygons representing the following were similarly extracted:

- federal & state parks,
- federal wilderness areas, federal recreation areas, & federal historic parks;
- federal & state wildlife refuges; and
- municipal watersheds.

Polygons representing federal lands that are “congressionally” or “administratively withdrawn” under the NW Forest Plan were extracted from the REO=s “LUA” dataset. Many of these lands, however, are military reservations and were eliminated from the interim LUA dataset. County and city parks, and tribal reservations were similarly removed from the MPL data set in developing the protected lands indicator data set and map.

Protected Areas Data:

The following data was used to develop the Protected Areas Map in combination with equivalent data from the Georgia Basin.

Subbasin Name	HUC Area (Ha) (Excl. Marine Areas)	Protected Lands (Ha)	% Protected	Protected at High Elevation (Ha)	% of Protected Lands at High Elevation
Fraser	62438	37766	60.5	32703	86.6
Strait of Georgia	115454	4118	3.6	0	0
San Juan Islands	45810	3766	8.2	0	0
Nooksack	200508	34480	17.2	30851	89.5
Upper Skagit	413227	308776	74.7	237544	76.9
Sauk	191565	108587	56.7	92118	84.8
Lower Skagit	112842	896	0.8	0	0
Stillaguamish	179697	20373	11.3	9965	48.9
Skykomish	217604	72862	33.5	57726	79.2
Snoqualmie	179564	40838	22.7	29171	71.4
Snohomish	75111	1746	2.3	831	47.6
Lake Washington	157918	1592	1	4	0.3
Green/Duwamish	123031	1648	1.3	467	28.3
Puyallup	260842	69649	26.7	64759	93
Nisqually	182548	15869	8.7	12213	77
Deschutes	41094	1	0	0	0
Skokomish	62546	14802	23.7	7576	51.2
Hood Canal	211727	51959	24.5	39339	75.7
Puget Sound	408228	5815	1.4	0	0
Dungeness/Elwha	215147	121018	56.2	80154	66.2
Crescent/Hoko	95068	11404	12	3879	34